

What is claimed is:

1. A display device comprising a thin film transistor substrate which includes at least an insulation substrate having 5 a background layer on a surface thereof, a polysilicon layer formed over the background layer, gate electrodes formed over the polysilicon layer by way of a first insulation layer which covers the polysilicon layer, a second insulation layer covering the gate electrode, a pair of source/drain electrodes formed 10 over the second insulation layer, the source/drain electrodes penetrating the second insulation layer and the first insulation layer and being in contact with the polysilicon layer, and a third insulation layer covering the source/drain electrodes, wherein

15 the source/drain electrode includes a cap layer made of molybdenum or a molybdenum alloy which is formed over a conductive layer made of aluminum or an aluminum alloy and is in contact with the third insulation layer, and a barrier layer made of molybdenum or a molybdenum alloy which is formed below the 20 conductive layer and is in contact with the polysilicon layer, and

the source/drain electrode further includes a molybdenum oxide nitride film on a surface of the barrier layer which is in contact with the conductive layer.

25 2. A display device according to claim 1, wherein a sum

of film thicknesses of the barrier layer and the molybdenum oxide nitride film is smaller than a film thickness of the cap layer.

3. A display device according to claim 2, wherein a sum of film thicknesses of the barrier layer and the molybdenum oxide nitride film is 60% or less of a film thickness of the cap layer.

4. A display device according to claim 1, wherein the display device includes an organic insulation layer which is formed over the third insulation layer and transparent electrodes which are formed over the organic insulation layer, and the transparent electrode penetrates the organic insulation layer and the third insulation layer and is connected to either one of source/drain electrodes.

5. A display device according to claim 1, wherein the display device includes transparent electrodes which are formed over the third insulation layer, the transparent electrode penetrating the third insulation layer and being connected to either one of source/drain electrodes, and reflection electrodes which have portions thereof connected with the transparent electrodes and are formed by way of an organic insulation layer.

20 6. A manufacturing method of a display device comprising:
a polysilicon pattern forming step for forming a polysilicon layer by patterning on a background layer of an insulation substrate having the background layer on a surface thereof;

25 a first insulation layer forming step for forming a first

insulation layer which covers the polysilicon layer;
a gate electrode forming step for forming gate electrodes
on the first insulation layer;
a second insulation layer forming step for forming a second
5 insulation layer such that the second insulation layer covers
the gate electrodes;
a contact hole forming step for forming contact holes which
penetrate the second insulation layer and the first insulation
layer; and

10 a source/drain electrode forming step for forming
source/drain electrodes which are connected to the polysilicon
layer through the contact holes on the second insulation layer;
wherein

the manufacturing method further includes a heat treatment
15 step in steps which come after the source/drain electrode forming
step, and

the source/drain electrode forming step further includes:
a barrier layer forming step for forming a barrier layer
by sputtering molybdenum or a molybdenum alloy;

20 an oxide nitride film forming step for forming an oxide
nitride film on a surface of the barrier layer by performing
the rapid heat treatment of the barrier layer in a nitrogen
atmosphere;

25 a conductive layer forming step for forming a conductive
layer by sputtering aluminum or an aluminum alloy layer; and

a cap layer forming step for forming a cap layer by sputtering molybdenum or a molybdenum alloy on the conductive layer.

7. A manufacturing method of a display device according
5 to claim 6, wherein the heat treatment step includes hydrogen termination treatment.

8. A manufacturing method of a display device according to claim 6, wherein the heat treatment step includes a CVD step.